

HILTON CREEK WATERING SYSTEM PROJECT

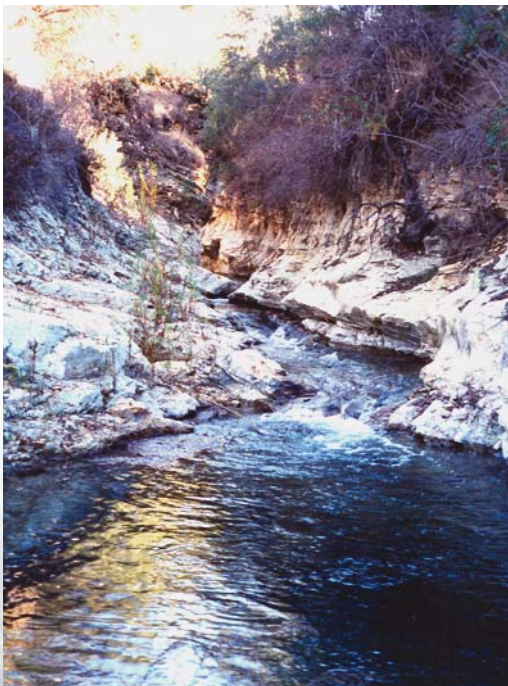
Project Completed: 1999

Total Cost: \$4,000,000

Federal Safety of Dams \$3,400,000 | Cachuma Member Agencies \$600,000



View of Hilton Creek taken in December 1999 immediately before the supplemental watering system was activated.



The flow shown in this photo demonstrates the immediate effectiveness of the water system hours after it was activated in late 1999.

The Problem

Hilton Creek naturally supports many steelhead and offers favorable habitat during wet water years. Prior to activating the Hilton Creek Watering System, the lower portion of Hilton Creek went dry during average and dry water years. The lack of flow and subsequent higher water temperatures did not allow steelhead to complete their life cycle. Back in 1998, a fish “rescue” was necessary to relocate over 800 stranded steelhead to more suitable conditions.

The Solution

The Hilton Creek Watering System provides additional water for steelhead spawning, rearing, and passage. It offers a dependable year-round source of cool water to enhance steelhead survival during the summer months until natural flow resumes in the winter. It consists of an extensive piping system that brings water from Lake Cachuma, through Bradbury Dam, to three release points in lower Hilton Creek. A flexible intake pipe and pumping system were installed in 2003 and 2004 to draw cool water at optimal depths as the lake level drops.

Project Benefits

The supplemental watering system increases the range of flows for steelhead migrating up Hilton Creek and supports various age classes of steelhead that inhabit the creek. Steelhead are able to complete their lifecycle now, and call Hilton Creek their home year-around.



Hilton Creek in 2004 showing establishment of significant vegetation growth along the creek bank to improve steelhead habitat.

Cachuma Conservation Release Board
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HILTON CREEK CASCADE CHUTE FISH PASSAGE ENHANCEMENT PROJECT

Project Completed: 2005
Total Cost: \$150,000

U.S. Bureau of Reclamation \$150,000



Hilton Creek Cascade facing upstream before construction.



Hilton Creek Cascade after constructing a series of step pools.

The Problem

Access to favorable steelhead habitat upstream was a severe challenge for migrating steelhead because of a six-foot high cascade and 140 foot long bedrock chute in Hilton Creek. This was especially true during periods of high velocity flow because of lack of deeper water and resting sites.

The Solution

The project increased the range of flows so that adult steelhead can now migrate upstream through the fish passage structure of Hilton Creek to reach favorable habitat. The project entailed dividing the six-foot cascade into a series of step pools that fish can more easily navigate, and constructing concrete baffles to slow down the water velocity and create resting pools in the bedrock chute area upstream of the cascade.

Project Benefits

The project enhanced the benefits of the Hilton Creek Watering System by providing migration opportunities for adult steelhead to reach additional spawning habitat. Immediately following construction, fish were observed moving through the completed structures.



Pool habitat in bedrock chute area of Hilton Creek after construction.

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Lower
Santa Ynez River
Fish Management Plan

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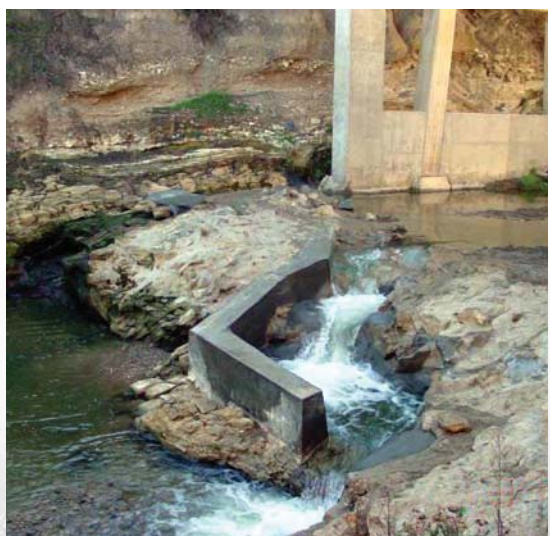
SALSIPUEDES CREEK AT HIGHWAY 1 BRIDGE FISH PASSAGE PROJECT

Project Completed: 2002
Total Cost: \$87,000

California Coastal Conservancy and California Department of Fish and Game \$87,000



The Highway 1 Bridge apron presents a low-flow fish passage impediment on lower Salsipuedes Creek. Photo taken before construction commenced.



The Highway 1 Bridge apron after construction.

The Problem

When the Highway 1 Bridge over Salsipuedes Creek was built, a concrete apron was constructed under the bridge to protect the bridge footings. Over time the apron was undercut by the stream causing a five-to six-foot drop off between the apron and the streambed. This also caused a low-flow barrier to steelhead, limiting their ability to reach prime spawning grounds in the winter upstream. In summer, the barrier completely blocked steelhead passage to cooler water for rearing.

The Solution

An opening in the apron was created by excavating three small pool habitats and bracketing them with a concrete shelf at their downstream end. Reinforced concrete was used to create three small pool areas in the lower portion of the structure, creating a backwater effect and reducing the height of the vertical barrier to 1.5 feet. Additional concrete structures were built to redirect flow from the low-flow pathways to the new pool area. Parts of the structure were lowered to enhance depth of flow through the reconfigured low-flow pathway.

Project Benefits

The improvements enhance steelhead migration during low-flow periods by focusing the flow through a stepped pool confined area and reducing the effective height over the barrier. Adult and juvenile steelhead were observed to successfully migrate upstream through the new structure. Steelhead were able to access suitable spawning and cooler rearing habitats upstream from the barrier.

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SALSIPUEDES CREEK AT JALAMA ROAD BRIDGE FISH PASSAGE ENHANCEMENT PROJECT

Project Completed: 2004
Total Cost: \$133,000

California Coastal Conservancy and California Department of Fish and Game \$109,000 | Cachuma Member Agencies \$24,000



Project site in April 2003 prior to project construction (facing upstream toward the Jalama Road bridge crossing).



Completed fish passage structure (facing upstream toward the Jalama Road bridge crossing).

The Problem

The upper portion of Salsipuedes Creek provides excellent steelhead spawning and rearing habitat, as opposed to the lower portion that becomes dry in some years. However, a concrete structure located downstream of the Jalama Road Bridge caused downcutting into the streambed. Thus, a deep pool was created that required upstream migrating steelhead to make a high vertical jump. In winter, this delayed migration to prime spawning grounds and in summer was a total barrier to the steelhead.

The Solution

A fish passage structure was constructed along a bedrock outcrop by building a series of three step-pools. This increased the range of flows during which adult steelhead can migrate through the fish passage structure.

Project Benefits

Steelhead now move unimpeded in Salsipuedes Creek during both winter and summer periods, which had been impossible for decades. Passage improvement at the Jalama Road crossing increases access to the high quality upper reaches. Migration is facilitated for spawning adults and oversummering juveniles, and the range of available spawning and rearing habitat is extended.

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EL JARO CREEK STREAMBED ENHANCEMENTS

Project Completed: 2004
Total Cost: \$136,000

State Water Resources Control Board and the California Coastal Conservancy \$103,000 | Cachuma Member Agencies \$33,000

The Problem

Land uses such as livestock operations can adversely affect many aquatic species, chiefly steelhead, by causing excessive sediment input into streams.

The Solution

Two public workshops presented techniques to reduce excessive sedimentation, and showed that the projects had achieved stabilization and floodplain enhancement of an eroding steambank adjacent to El Jaro Creek. Three projects were implemented:

- Replacement of an undersized culvert, and reinforcement of both the upstream and downstream approaches to the culvert with large boulders to direct flow and eliminate scouring of the riverbed. This stabilized the stream channel and stream bank.
- Placement of large boulders within a side channel to reduce water velocity and eliminate the scouring potential. This stabilized an exposed channel about 100 feet downstream of the culvert.
- Installation of 4 to 5-ton boulders and excavated material along the toe of the slope, to prevent water from eroding away the adjacent streambank during high flows. Willow cuttings were placed between the boulders to enhance the riparian environment and create shade for the stream.

Project Benefits

Three areas on El Jaro Creek were selected to demonstrate to local, private landowners that sedimentation caused by land uses can be controlled and managed by implementing technically feasible, cost-effective solutions. Loss of valuable ranch land was prevented by reducing the amount of erosion. Habitat for steelhead was also improved by reducing fine sediments, creating new rearing habitat along the toe of the floodplain, and increasing vegetation and cover for the fish.



Culvert replacement project after construction.



El Jaro Creek bank stabilization and floodplain enhancement project after construction.

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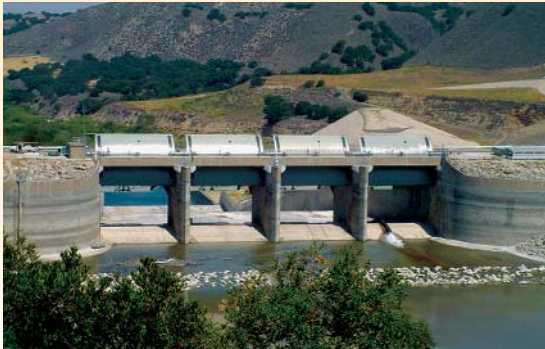
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LAKE CACHUMA SURCHARGE PROJECT

Project Completed: 2004

Total Cost: \$835,000

California Coastal Conservancy \$200,000 | Cachuma Member Agencies \$635,000



Bradbury Dam spillway radial gates.



Placement of 50-foot by 30-foot steel gate extensions on the radial gates.

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The Problem

Maintaining summer rearing flows and enhancing winter migration opportunities for steelhead require substantial water releases from Lake Cachuma. The Lake Cachuma Surcharge Project was a critical component to provide the additional water needed for steelhead in the Lower Santa Ynez River and Hilton Creek.

The Solution

Four 50-foot by 30-foot steel gate extensions, or “flashboards”, were installed on the Bradbury Dam spillway radial gates to allow the water in Lake Cachuma to rise up to three feet when Lake Cachuma fills and spills. This surcharge substantially increases the amount of water available in wet years to enhance and maintain downstream fishery flows, and minimizes impacts to water supply.

Project Benefits

After Lake Cachuma spills, the additional 9,200 acre-feet of water from the surcharge project accomplishes two strategies: improve passage opportunities for upstream migrating steelhead, and provide additional rearing areas during the summer following reservoir spills. Water releases are made from the surcharged water during the following winter to augment natural stormflows in the river that extend the time steelhead have to migrate by about two weeks. Water is also released to provide summer rearing habitat for young steelhead and rainbow trout.



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